Native legumes for gardens

F. Bridgman

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Our native flora include some of the most beautiful flowers, shrubs and trees in the world—a fact which is well appreciated in California and on the French Riviera. The intensely blue Leschenaultia, deep violet Hovea, scarlet and black Sturt Pea, red, yellow and pink-flowered Verticordias and Mallee Eucalypts find many admirers abroad. Like prophets, our native plants "have not been without honour, save in their own country."

But the attitude to native plants in Western Australia is now gradually changing. Native plants fit in very well with modern ideas on garden planning, with emphasis on informality and naturalism and a tendency to get away from the straight lines, formality and "neatness" of which the gardeners of past decades were overfond. Many native plants are easily-grown, hardy, can stand great heat readily and can survive with little water so that they are often ideal for country gardens or where only limited attention can be given to them.

In this article, I intend to deal with the techniques of cultivating those natives that belong to the botanical family of legumes which have their seeds borne in characteristic pods like the pods of peas, beans and clover. There are many plants of this family native to Australia.

Legumes, as most farmers know, have another important character in common; they have bacteria in nodules on their roots which supply the host plants with nitrogen from the air and hence improve the growth of legumes on soils poorly or only moderately supplied with fixed forms of nitrogen.

Of course, if a legume for any reason is not infected with the correct strain of nitrogen-fixing bacteria, nitrogen fertilisers may then be necessary. This brings up the problem that different groups of related legumes need different strains of nitrogen bacteria. Furthermore,
the bacteria strains must not only be capable of forming nodules but also be effective in supplying the plant with nitrogen. Different bacteria strains varying widely in their efficacy in this regard. A suitable strain of bacteria can be obtained in five general ways:

1. It is already existing in the soil from previous legumes related to the planted legume.
2. Accidental introduction into the soil through manure and similar means.
3. Accidental introduction on seeds and pods.
4. By scattering soil in which the plant has previously thrived and been well nodulated onto the area in which it is to be grown. This may also introduce diseases and weeds.
5. By inoculation of the seeds with a culture of correct strain of bacteria for the plant concerned.

The lastmentioned method is usually the safest, most reliable and simplest, but cultures of the correct strain of bacteria for native legumes are not usually available, and other methods must be tried. By obtaining soil from around where native legumes of the species to be grown are found and scattering it in the bed to be sown, then working it into the ground and avoiding contact with fertilisers, we can often ensure that the plants receive adequate bacterial aid.

FERTILISER

The statement is often made that native plants do not like artificial fertiliser. While not disputing that this may be true for a few kinds, most of the native plants with which I have had experience do not seem to be harmed by it. On the contrary, I have seen many cases of undoubted benefit and particularly does this apply to native legumes in regard to superphosphate. For most native legumes, I would suggest 1 oz. per square yard of super at planting and 1/2 to 1 oz. per square yard for each year afterwards.

Potash is another fertiliser to which native legumes often respond, and on light soil I would suggest 1/2 to 1 oz. per square yard at planting and 1/4 oz. per square yard each year afterwards. If the legumes are well inoculated with nitrogen-fixing bacteria, nitrogenous fertilisers should not be essential, but if nodulation is absent or ineffective, some nitrogen may be helpful. Blood and bone can be used as a gradually available source of nitrogen at 1/4 to 1 oz. per square yard at planting or when the condition of the plants indicates the need. Alternatively, sulphate of ammonia should be applied in much smaller quantities and more often—say about 1/4 oz. per square yard about every two months, again having regard to the condition of the plant.

There is little evidence of the effect of lime on native legumes (and therefore no prediction of its effect can be made) but most native legumes grow naturally in acid or slightly acid soils. In my experience, most do not require lime, though this may need modifying later.

An exception is those natives which grow naturally in lime-rich soils—the Templetonia for instance. On such plants as these, lime can be used generously as a matter of prudence (rather than on any available evidence of necessity). The safest form of lime to use in these cases is ground limestone. This can be dug into the surrounding soil at about 4 to 8 oz. per square yard.

A fifty-fifty mixture of limestone and super at 1 oz. per square yard can be used with advantage with the seeds of most native legumes—the lime helps to prevent the super affecting adversely seed germination or the nitrogen bacteria.

On the question of trace elements, there is no specific evidence of deficiency symptoms or lack of growth from these causes in native legumes—probably due to lack of study. Perhaps the safest course to follow is to use trace elements such as copper, zinc and molybdenum only when they are known to be required for other plants on the soil concerned. Even on such a soil, trace elements generally only need to be used once in five years.

Animal manures do not seem essential so far for native plants, though it is in order to use a soil previously heavily manured for other non-native plants. Recently, however, I have had some benefit from cow manure applied lightly to Sturt Peas.

When ready-mixed fertilisers are used in the garden, purchase a type quite rich
in superphosphate plus a fair quantity of potash in proportion to other ingredients for native legumes. Apply such a mixture at about 2 oz. per square yard once at each planting or once each year according to the life of the plant.

Of course direct contact of seed and fertiliser should be avoided. Ideally, fertiliser should be placed about 2 in. below and about 2 in. to the side of the seed.

SEED GERMINATION

The seeds of many legumes have a proportion of seeds with so called hard coats—which means that such coats are impermeable to water. These hard seeds cannot germinate immediately because of this and, indeed, can only germinate at long intervals as the hard coat decays or becomes otherwise permeable. In nature, hard-seededness of a proportion of seed is a protection against drought as all seeds do not then germinate with one light rain, only to die off afterwards when no following rains occur. Instead, the hard seeds germinate when heavier rains occur later or remain to germinate in other succeeding, more favourable seasons. This hard-seeded characteristic is found particularly well-developed in seeds of legumes native to the dry environment of Australia—so much so that seeds of some native legumes are almost entirely hard-seeded, and so formidably hard-seeded, that without treatment, they will not germinate for many years.

Hard-seededness is naturally a disadvantage in garden cultivation. It can be overcome in a number of ways. Under natural conditions it may be overcome by fire which also provides good seedbed conditions for the seed to grow—indeed in some native plants, hard-seededness may have the purpose, through fire, of providing a good ash seed bed in addition to being an insurance against droughts. However, fire is hard to use under garden conditions as sufficient control to ensure a quick burn of suitable temperature is hard to secure. One possible way of using the fire principle is to slide seeds rapidly down a small inclined plane heated in one spot to a measured high temperature—such a method has been used successfully with lucerne seeds.

Soaking in hot water can also be done. It gives some improvement in germination but is likely to render the seeds much more liable to disease. A quite practical and generally superior method is scarification by rubbing the seeds vigorously for a few minutes between two pieces of sandpaper. This scratches the hard coat and makes it more permeable to water. The effectiveness of the treatment can be judged by afterwards soaking the seed overnight in cold water, if so desired—those seeds that swell without damage are properly done. Some seeds will need more rubbing than others. Satisfactory germination of many native legumes can be secured in this way, including Sturt Peas, Kennedyas, Hardenbergias and Hoveas. With some of the larger seeds, like Acacias, it may be preferable to lightly file the coats or nick them with a blade—provided the seed is damaged as little as possible.

SEEDBED CONDITIONS

All the above methods—except possibly fire—lead to the seeds being in a greater or lesser degree more subject to disease. Many native legumes are very susceptible
to “damping off” in their early stages. To minimise this, plant only at the right time. Cold, wet conditions are fatal to some plants in this respect. Use spring planting where possible.

Obtain a disease-free soil for germination. For seedlings that can be transplanted, a virgin sand is probably the best. If this is not obtainable, the soil used in the seedbox should be sterilised by hot fire, by formalin, by methylbromide, or by vapam.

Another protective against damping off is to dust the seeds with tetroc or spergon seed dust before sowing. This may adversely affect any nitrogen-fixing bacteria on the seed but in bad cases of “damping off” is the lesser evil. A still further method is to water in ziram, thiram or a similar preparation before planting. This also destroys nitrogen-fixing bacteria. If damping off appears in germinating seedlings, ziram or thiram may be watered in to prevent the disease spreading.

TRANSPANTING

Native plants may be difficult in this regard. Some, like Sturt Peas, are difficult to transplant at all but can be readily raised where they are to flower. Most can be transplanted with care, possibly using root hormones as an aid. In transplanting from the bush, a lot of care is needed. The plant must be very small and the soil moist. The whole soil around the plant down to the usually lengthy root must be moved with the least disturbance possible.

Watering.

Many native plants are very hardy and can stand long periods without water, or at least use less than other plants. This is an advantage where water is scarce. There are qualifications, however. If a plant native to a 30 in. rainfall is grown in a 15 in. rainfall, supplementary watering will probably be necessary in winter and spring. Species native to swampy or wet situations will require ordinary summer watering.

However, while they can survive on very little water, even species native to very dry areas are not harmed usually by watering and may, indeed, benefit greatly from it in faster growth and better flowers. The Sturt Pea is a case in point.

DISCUSSION OF INDIVIDUAL SPECIES

It is impossible to discuss exhaustively all native legumes that may warrant garden cultivation but brief notes on a selection of plants are given below. Because of the confusion caused by common names (there may be several botanical species that differ widely yet in garden cultivation are given one common name, or several common names may be given in different districts to one plant) preference to botanical names is given in this list. In any case, a large number of natives have no common name at all, or if they have, it is often inappropriate, if not misleading. For instance, the Sturt Pea was not first discovered by Sturt, but by Dampier much earlier. The botanical name Clianthus formosus which can be taken as meaning “Glorious Flower of beautiful form,” sounds better, is more poetic and more appropriate to this beautiful gem than a flat comparison with a garden pea.

Acacias.

Acacias or wattles are one of the characteristic Australian plants with species too numerous to mention. Suffice it to say that acacias, are rapidly-growing trees that can quickly create shade, greenery and flowers. Despite ideas to the contrary, limbs of acacias do not break off readily. They are short-lived but new specimens can be grown so rapidly, that this is hardly a disadvantage.

The jam tree (A. acuminata) is quite shapely and forms a good specimen for fast-growing avenues.

The Cootramundra wattle (A. Baileyana) is perhaps the best known wattle in cultivation. Its bluish-green foliage, attractive shape and early winter flowers make it worthwhile as a quick growing small tree, flowers yellow.

A. Drummondii is an attractive shrub species of acacia growing only four feet in height with large yellow rod-shaped flowers. Other West Australian dwarf types are also popular.

The Silver wattle of south Queensland (A. podalyriaefolia) is attractive small winter-flowering tree, with yellow flowers.

Golden Wattle (A. pynantha) is an attractive small tree or shrub, the older leaves broad and sickle shaped, the flowers large, yellow and fragrant.
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The Weeping Wattle (*A. saligna*) has pendulous foliage like weeping willows and large flower-balls that appear in late spring.

**Burtonia scraba.**

This is a small plant growing in rather wet conditions in the lower South-West. It has attractive mauve flowers which should make it worth while cultivating. Seed germination, I have found is rather poor even with scarifying and plants are inclined to die out.

**Chorizema.**

The Flame Peas or Dancing with Joy. *C. cordatum* and *C. ilicifolurm* are well known and easily-obtainable species of this genus. These species have red, flame and yellow pea flowers and are some of the easiest natives to grow. *C. cordatum* in particular is one of the best small shrubs. Established plants can be obtained from a few nurseries while they can also be raised from seed.

**The Sturt Pea (Clianthus formosus).**

Despite a few difficulties, this is actually one of the easiest and certainly one of the most rewarding natives. It is very difficult to transplant so is best raised from seed sown where it is to remain. It will grow on a large variety of soils from clay loam to pure sands. Seed should be scarified before sowing. In most areas in the southern wetter parts of Australia, it is best sown from October to January and treated as an annual as winter conditions in the heavy rainfall areas do not suit it very well. Seed can be sown fairly thickly if desired and later thinned to about 15 in. apart. It responds well to fertiliser. In the summer, it can and should be watered like other garden plants but it can grow also under quite dry conditions.

**Crotalaria.**

There are a number of this mainly tropical genus native to Australia. *C. Cunninghamii*, the Dwarf Birdflower or Parrot Plant is a most spectacular and unusual plant, bearing large flowers in green streaked with purple, looking like an exotic bird. It is a shrub about 5 ft. high. It grows naturally in northern areas, but could be tried further south where frosts are not severe.

**Hardenbergia.**

These perennial creepers are readily cultivated in gardens and are very effective, even striking, in growing up, over and hanging from quite large trees or in covering stumps or as climbers along fences. They provide small blue flowers in profusion in early spring. Sowing can be done in autumn, winter or spring. They will survive without summer watering in over 25 in. rainfall, but watering does not usually hurt them.

*H. Comptoniana* is the W.A. native inappropriately called Wild Sarsaparilla.

*H. Violacea* is native to the Eastern States, mostly violet but also pink and white flowered. On the whole, not as good as the W.A. species. Lime can be used with Hardenbergias.

**Hoveas.**

These plants with their lovely violet flowers can be grown as herbaceous perennial or small shrubs in the garden or in a special corner of the rockery. Gravelly loams or light sandy soils seem preferred. They can be grown with summer watering in the garden, but some plants might die, so a separate situation where no summer watering is practised and where the soil can be separately controlled might be preferable. Drainage must be good. Semi-shade such as that received in their native habitat from overchanging trees and shrubs may be an advantage for some species. Seed is easily raised by sowing sandpapered seed in autumn (March to
early June) or in early spring and will flower the following winter. A percentage of the young plants may yellow and die. The cause of this is not known. Transplanting from seedboxes or open ground is difficult also, because of root disturbance. Pots or tubes, the contents of which can be moved with less disturbance, are to be preferred.

_H. trisperma_ is one of the best species to cultivate. Leaves are non-prickly, about 2 ft. high.

_H. chorizemifolia_ or holly-leaved hovea has prickly leaves but makes a nice little shrub.

_H. elliptica_ is a non-prickly species, taller growing than the preceding.

**Kennedyas.**

This genus includes some of the best native climbers and is also one of the easiest native plants to grow—some species are very vigorous and rapid growing, but despite opinions to the contrary, they are controllable and effective in garden cultivation. These vigorous species are ideal for quickly covering pergolas, disguising fences or garden subdivisions. Other species do not grow so big and can be used on small stumps or trailing over rockeries. Prostrate species can be used as ground carpets between shrubs. Seed is best sown in autumn or winter though*

*and yellow flowers combined with beautiful leaves. When planting this species, it must have plenty of room for development and be so situated that it is not allowed to become a nuisance. It tends to form dense tangles of growth and smother other plants. Nevertheless, it is not as bad as some other climbers commonly used in this respect—for instance Tecomas and Bouganvillea. _K. nigrificans_ does not root along the stem and has no rhizomes so is not dangerous in this respect. It can be kept pruned back. In my experience, this Kennedya is excellent in a situation otherwise unused. It can be used for covering up back fences, for growing up large trees as an arresting garden feature or for large pergolas on suburban blocks.

Other species of Kennedya worthy of garden attention include _K. rubicunda_, a red flowered hardy climber with considerable merit. _K. beckiana_, a woody twiner, red flowered. _K. stirlingia, K. prostrata_, not very spectacular but useful for ground cover or in rockeries and _K. macrophylla_ which is like _K. nigrificans_ but has blue and yellow flowers. It is quite rare.

**Swainsonias.**

These plants are sometimes wrongly called native vetches but are distinct from the vetch species. Among the numerous species are small shrubs, weak semi-climbers and trailing plants. They are mostly native to dry areas but at least some have been grown in watered garden conditions in the wetter areas. The flowers of many species are small and consequently of only limited decorative value but others are larger and look very striking. In my experience, seed is best sown in spring but in drier areas could be sown in winter.

_S. greyana_ has flowers rather larger than most other species of Swainsonia. It is a semi-erect, rather weak-stemmed plant which, however, can be kept in fairly good shape by tying. Flowers are bright pink or red borne freely in clusters in summer, the numerous flowers making the plant quite attractive. The flowers are contrasted with whitish, woolly buds.

**Templetonia.**

_T. retusa_ is the ordinary Templetonia that grows in limestone areas along the sea coast, often near the margins of
swamps in the tuart country of West Australia. This species is the most showy member of this genus. Its large and brilliant red flowers borne in late winter and spring make it a desirable small shrub for gardens. It is quite easily cultivated in coastal areas near Perth. Where limestone does not exist in the soil, ground limestone can be incorporated in the ground before planting. Young plants can be purchased in Perth and they also can be raised from seed. As well as the usual red-flowered form, there also exists a cream-flowered sport or variety of this species which should well repay being brought into cultivation.

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OBITUARY

Shortly after the previous issue of this Journal had gone to press, the Department of Agriculture suffered a severe loss in the passing of its Assistant Chief Veterinary Officer, Mr. Edward Flower Twaddle, M.R.C.V.S., whose death occurred in the Royal Perth Hospital on July 31, 1958, after an illness lasting four weeks.

The late Mr. Twaddle, who was 57 years of age, graduated in Dublin and joined the Department of Agriculture of Western Australia in 1928. After serving as a Departmental Veterinary Officer at Bunbury and Derby for some years he was appointed as Animal Quarantine Officer at Fremantle—an important post in which he superintended all animal imports and exports and was responsible for the enforcement of quarantine regulations.

In the years prior to World War II he held the rank of captain in the Royal Australian Army Veterinary Corps and was well-known to many officers and men of the 10th Australian Light Horse Regiment whose annual camps he frequently attended. During the war he held the rank of major and commanded the 5th Australian Veterinary Hospital at "Fairlawn," Herne Hill.

A conscientious and efficient officer, Mr. Twaddle was held in high regard both by his colleagues in the Department of Agriculture and by the many officials and members of the public with whom he came into contact in the course of his professional duties.

He is survived by a widow, a son and two daughters to whom the deepest sympathy of his many friends is extended in their great loss.
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